

Docket No.: SMARB15.001APC

December 20, 2005

Page 1 of 1

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**TRANSMITTAL LETTER
INFORMATION DISCLOSURE STATEMENT**

Applicant : Lee et al.
App. No : 10/540,279
Filed : June 21, 2005
For : CHEMICAL SWITCHING OF NUCLEIC
ACID CIRCUIT ELEMENTS
Examiner : Unknown
Art Unit : 2161

CERTIFICATE OF MAILING

I hereby certify that this correspondence and all marked attachments are being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Mail Stop: Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on

December 20, 2005

(Date)

Marina L. Gordey, Reg. No. 52,950

Mail Stop Amendment

Commissioner for Patents

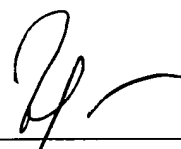
P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Enclosed for filing in the above-identified application are:

- (X) An Information Disclosure Statement and PTO/SB/08 equivalent listing references for consideration:
 - (X) Listing 57 references.
 - (X) Enclosing 52 references.
- (X) The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Account No. 11-1410.
- (X) Return prepaid postcard.


Marina L. Gordey
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INFORMATION DISCLOSURE STATEMENT

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Art Unit	: 2161

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing 57 references to be considered by the Examiner. Also enclosed are 52 foreign patent references and/or non-patent literature as listed on the Information Disclosure Statement.

This Information Disclosure Statement is being filed before the receipt of a first Office Action on the merits, and presumably no fee is required. If a first Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 C.F.R. § 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: December 20, 2005

By: 

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	10/540,279	
	Filing Date	June 21, 2005	
	First Named Inventor	Lee, Jeremy S.	
	Art Unit	2161	
SHEET 1 OF 4		Examiner	Unknown
		Attorney Docket No.	SMARB15.001APC

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	5,591,578	01-07-1997	Meade et al.	
	2	5,705,348	01-06-1998	Meade et al.	
	3	5,770,369	06-23-1998	Meade et al.	
	4	5,780,234	07-14-1998	Meade et al.	
	5	5,824,473	10-20-1998	Meade et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	6	WO 99/31115 A1	06-24-1999	Univ. of Saskatchewan		
	7	WO 02/095840 A1	11-28-2002	Univ. of Saskatchewan Technologies Inc.		
	8	WO 99/04440 A1	01-28-1999	Technion Res. and Dev. Found.		
	9	EP 1 215 199 A1	06-19-2002	Sony Int'l		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	10	AICH, P. et al. 1999 "M-DNA: A complex between divalent metal ions and DNA which behaves as a molecular Wire", <i>J. Mol. Biol.</i> 294: 477-485.	
	11	AICH, P. et al. 2002 "Long range molecular wire behavior in a metal complex of DNA", <i>J. Biomol. Struct. Dynamics</i> 20: 1-6.	
	12	ARKIN, M. R. et al. 1996 "Rates of DNA-mediated electron transfer between metallointercalators", <i>Science</i> 273: 475-480.	
	13	ARMITAGE, B. et al. 1994 "Cationic anthraquinone derivatives as catalytic DNA photonucleases: mechanisms for DNA damage and quinine recycling" <i>J. Am. Chem. Soc.</i> 116:9847-9859.	
	14	BIXON, M. & JORTNER, J. 2001 "Charge transport in DNA via thermally induced hopping", <i>J. Am. Chem. Soc.</i> 123: 12556-12567.	
	15	BIXON, M. et al. 1999 "Long range charge hopping in DNA", <i>PNAS USA</i> 96: 11713-11716.	
	16	BRAUN, E. et al. 1998 "DNA-templated assembly and electrode attachment of a conducting silver wire", <i>Nature</i> 391: 775-778.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

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	First Named Inventor	Lee, Jeremy S.
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SHEET 2 OF 4	Attorney Docket No.	SMARB15.001APC

NON PATENT LITERATURE DOCUMENTS

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	17	CHANON, M. et al. 1988 "Photochemistry of homogeneous and heterogeneous chemical gears involving electron transfer catalysis: chains, catalysts and sensitization. Relations to electrochemistry, synthetic applications and mechanistic basis for selectivity" In Fox, M.A., and Chanon, M. (eds.), Photoinduced Electron Transfer Part A: Conceptual Basis, Elsevier, New York, pp. 409-597.	
	18	DANDLIKER, P. J. et al. 1997 "Oxidative thymine dimer repair in the DNA helix", <i>Science</i> 275: 1465-1468.	
	19	DUCKETT, D. R. & LILLEY, D. M. J. 1990 "The three-way DNA junction is a Y-shaped molecule in which there is no helix-helix stacking", <i>EMBO Journal</i> 9: 1659-1664.	
	20	FAHLMAN, R. P. & SEN, D. 2002 "DNA conformational switches as sensitive electronic sensors of analytes", <i>J. Am. Chem. Soc.</i> 124: 4610-4616.	
	21	FAHLMAN, R. P. et al. 2002 "The charge conduction properties of DNA Holliday junctions depend critically on the identity of the tethered photooxidant", <i>J. Am. Chem. Soc.</i> 124: 12477-12485.	
	22	FOX, M.A. 1990 "Photoinduced electron transfer" <i>Photochem. Photobiol.</i> 52:617-627.	
	23	GASPER, S. M. 1997 "Intramolecular photoinduced electron transfer to anthraquinones linked to duplex DNA: The effect of gaps and traps on long-range radical cation migration", <i>J. Am. Chem. Soc.</i> 119: 12762-12771.	
	24	GELBART, W.M., et al. 2000 "DNA Inspired Electrostatics", <i>Physics Today</i> 53: 38-44.	
	25	GIESE, B. & WESSELY, S., "The Influence of Mismatches on Long-Distance Charge Transport through DNA", <i>Angew. Chem. Int. Ed.</i> 39: 3490-3491.	
	26	GIESE, B., et al. 2001 "Direct observation of hole transfer between adenine bases and by tunneling", <i>Nature</i> 412: 318-320 (Abstract only).	
	27	GOMEZ-NAVARRO, C. et al. 2002 "Contactless experiments on individual DNA molecules show no evidence for molecular wire behavior", <i>PNAS USA</i> 99: 8484-8487.	
	28	HALL, D. B. et al. 1996 "Oxidative DNA damage through long-range electron transfer", <i>Nature</i> 382: 731-735.	
	29	HENDERSON, P. T. et al. 1999 "Long-distance charge transport in duplex DNA: The phonon assisted polaron-like hopping mechanism", <i>PNAS USA</i> 96:8353-8358.	
	30	HESS, S. et al. 2001 "On the apparently anomalous distance dependence of charge-transfer rates in 9-amino-6-chloro-2-methoxyacridine-modified DNA", <i>J. Am. Chem. Soc.</i> 123: 10046-10055.	
	31	HURLEY, D. J. & TOR, Y. 2002 "Donor/Acceptor interactions in systematically modified Ru ^{II} -Os ^{II} oligonucleotides", <i>J. Am. Chem. Soc.</i> 124: 13231-13241.	
	32	JORTNER, J. et al. 1998 "Charge transfer and transport in DNA", <i>PNAS USA</i> 95: 12759-12765.	
	33	KELLEY, S.O. et al. 1997 "Photoinduced Electron Transfer in Ethidium-Modified DNA Duplexes: Dependence on Distance and Base Stacking", <i>J. Am. Chem. Soc.</i> 117: 9861-9870.	
	34	LEE, J. S. et al. 1993 "A cooperative conformational change in duplex DNA induced by Zn ²⁺ and other divalent metal ions", <i>Biochem. Cell Bio.</i> 71: 162-168.	

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SHEET 3 OF 4	Attorney Docket No.	SMARB15.001APC

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	35	LEWIS, F. D. et al. 1997 "Distance-Dependent Electron Transfer in DNA Hairpins", <i>Science</i> 277:673-676.	
	36	LILLEY, D. M. J. 2000 "Structures of helical junctions in nucleic acids", <i>Quart. Rev. Biophys.</i> 33: 109-159.	
	37	LIU, M. D. et al. 1991 "Redox and structural properties of quinone functionalized phosphatidylcholine liposomes", <i>J. Phys. Chem.</i> 95: 1858-1865.	
	38	LOUFTY, R.O. et al. 1976 "Correlation between photographic properties of dyes and their electrochemical and spectroscopic parameters" <i>Photographic Science Engineering</i> 20:165-174.	
	39	LY, D. et al. 1996 "Cleavage of DNA by irradiation of substituted anthraquinones: Intercalation promotes electron transfer and efficient reaction at GG steps.", <i>J. Am. Chem. Soc.</i> 118-8747-8748.	
	40	MAO, C. et al. 1999 "A nanomechanical device based on the B-Z transition of DNA", <i>Nature</i> 397: 144-146.	
	41	MEGGERS, E. et al. 1998 "Sequence dependent long range hole transport in DNA", <i>J. Am. Chem. Soc.</i> 120: 12950-12955.	
	42	NIEMEYER, C. M. & ADLER, M. 2002 "Nanomechanical devices based on DNA", <i>Angew. Chem. Int. Ed.</i> 41(20):3779-3783.	
	43	O'NEILL, M. A. & BARTON, J. K. 2002 "2-Aminopurine: A probe of structural dynamic and charge transfer in DNA and DNA: RNA hybrids", <i>J. Am. Chem. Soc.</i> 124: 13053-13066.	
	44	PASCALY, M. et al. 2002 "DNA mediated charge transport: Characteristics of a DNA radial localized at an artificial nucleic acid base", <i>J. Am. Chem. Soc.</i> 124: 90083-9092.	
	45	PORATH, D. et al. 2000 "Direct measurement of electrical transport through DNA molecules", <i>Nature</i> 403: 635-6738.	
	46	RAJESH, C. S. et al. 2001 Photoinduced Electron-Transfer within Free Base and Zinc Porphyrin Containing Poly(Amide) Dendrimers", <i>J. Phys. Chem. B.</i> 105: 10175-10188.	
	47	RAKITIN, A. et al. 2001 "Metallic conduction through engineered DNA: DNA nanoelectronic building blocks" <i>Phys. Rev. Lett.</i> 86:3670-3673.	
	48	SEEMAN, N. C. & KALLENBACH, N. R. 1994 "DNA branched junctions", <i>Ann. Rev. Biophys. Biomol. Struct.</i> 23: 53-86	
	49	SPONER, J. et al. 1999 "Interactions of Hydrated IIa and IIb Group Metal Cations with Thioguanine-Cytosine DNA Base Pair: Ab initio and Density Functional Theory Investigation of Polarization Effects, Differences Among Cations, and Flexibility of the Cation Hydration Shell", <i>J. Biomol. Struct. Dyn.</i> 17: 61-77.	
	50	STORM, A. J. et al. 2001 "Insulating behavior for DNA molecules between nanoelectrodes at the 100 nm length scale", <i>Appl. Phys. Lett.</i> 79: 3881-3883.	
	51	TAUBES, G. 1997 "Double Helix Does Chemistry at a Distance – But How?", <i>Science</i> 275: 1420-1421.	
	52	WANG, J. et al. 1999 "Electrochemically Induced Release of DNA From Gold Ultramicroelectrodes", <i>Langmuir</i> 15: 6541-6545.	

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	53	WETTIG, S. D. et al. 2003 "M-DNA: a self assembling molecular wire for nanoelectronics and biosensing", <i>Anal. Sci.</i> 19: 23-26.	
	54	WIGHTMAN, R. M. et al. 1976 "Protonation kinetics and mechanisms for 1,8-dihydroxyanthraquinone and anthraquinone anion radicals in dimethylformamide solvent", <i>J. Am. Chem. Soc.</i> 98: 2562-2570.	
	55	YAN, H. et al. 2002 "A robust DNA mechanical device controlled by hybridization topology", <i>Nature</i> 415: 62-65.	
	56	ZHANG, H. et al. 2002 "A Comparative Study on Photo-Induced Electron Transfer from Fluorescein to Anthraquinone and Injection into Colloidal TiO ₂ ", <i>J. Colloid Interface Sci.</i> 251: 443-446.	
	57	ZHANG, X. et al. 2002 "Paranemic cohesion of topologically-closed DNA molecules", <i>J. Am. Chem. Soc.</i> 124: 12940-12941.	

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